

## CLAIMS

1. An electro-optic filament or fibre (10) comprising an elongate core (11) within a volume (12) of polarisable material, and an outer member (13) overlying the said volume, wherein:

5 (i) the core (11) and the outer member (13) are electrically conducting and respectively connectable to electrical potentials to generate a field (14) therebetween; and

(ii) the polarisable material (12) exhibits an optical effect when subjected to a said field (14) and/or a change in a said field, the said  
10 optical effect being visible or otherwise optically detectable externally of the filament or fibre (10).

2. A filament or fibre according to Claim 1 wherein the outer member (13) is optically transmissive and/or transfective.

15 3. A filament or fibre according to any preceding claim whose subcomponents are flexible, whereby the filament or fibre (10) is flexible.

4. A filament or fibre according to any preceding claim wherein  
20 the core (11) is or includes a flexible rod made of or from a material selected from the list including:

an electrically conducting metal;

an electrically conducting polymer;

a polyamide coated with a conducting material; or

25 combinations of two or more aforesaid materials.

5. A filament or fibre according to any of Claims 1 to 4 wherein the outer member includes a surface adjacent which the said volume lies.

30 6. A filament or fibre according to any preceding claim wherein the outer member surrounds the said volume.

7. A filament or fibre according to Claim 5 or Claim 6 wherein the outer member and the said volume are adhered one to the other.

8. A filament or fibre, according to Claim 6 or any claim depending from Claim 6, of generally circular cross-section, wherein the core, the said volume and the outer member are generally mutually concentric.

9. A filament or fibre according to any preceding claim wherein the volume (12) of polarisable material includes one or more of:

- a liquid crystal material;
- a microencapsulated, polarisable ink; or
- a "twisting ball" composite.

10. A filament or fibre according to Claim 9 wherein the volume (12) of polarisable material includes a pigment.

11. A filament or fibre according to Claim 10 wherein the pigment is an inorganic phosphor pigment; titanium dioxide; or a mixture thereof.

12. A filament or fibre according to any preceding claim wherein the resistance of the outer member (13) is inhomogeneous.

13. A filament or fibre according to Claim 11 wherein the inhomogeneity of the resistance of the outer member (13) results from one or more of:

- (i) one or more discontinuities (13a) in the material of the outer member (13);
- (ii) non-uniformity of the thickness (13b) of the outer member (13);
- (iii) non-uniformity of the resistivity of the material of the outer member (13); or

(iv) non-uniformity of the composition of the outer member (13).

5 14. A filament or fibre according to any preceding claim the core (11) and/or the outer member (13) of which is operatively connected to an electrical potential that varies in dependence on the output or state of a transducer (T).

10 15. A self-sustaining structure including one or more filaments or fibres (10) each according to any preceding claim.

16. A structure according to Claim 15 wherein the or each said fibre (10) is interlaced with a further fibre.

15 17. A structure according to Claim 15 or Claim 16 including a plurality of fibres (10) each according to any of Claims 1 to 13 woven, knitted or crocheted together.

20 18. A garment including one or more filaments or fibres each according to any of Claims 1 to 14; and/or a structure according to any of Claims 15 to 17.